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Taxonomic recommendations for British birds: Sixth report

GEORGE SANGSTER,[1,2]* J. MARTIN COLLINSON,[3] ALAN G. KNOX,[4] DAVID T. PARKIN[5] & LARS SVENSSON[6]

[1]*Department of Vertebrate Zoology, Swedish Museum of Natural History, PO Box 50007, SE–104 05 Stockholm, Sweden*

[2]*Department of Zoology, Stockholm University, SE–106 91 Stockholm, Sweden*

[3]*School of Medical Sciences, Institute of Medical Sciences, University of Aberdeen, Aberdeen AB25 2ZD, UK*

[4]*Historic Collections, King's College, University of Aberdeen, Aberdeen AB24 3SW, UK*

[5]*Institute of Genetics, Queen's Medical Centre, University of Nottingham, Nottingham NG7 2UH, UK*

[6]*S:ta Toras väg 28, SE–260 93 Torekov, Sweden*

This paper is the sixth report of the Taxonomic Sub-Committee of the BOU Records Committee relating to the British List. The fifth report of the Sub-Committee was published in *Ibis* **150**: 833–835.

A revised taxonomic sequence of the passerines

Since the publication of Sibley and Ahlquist (1990), numerous molecular studies have been published that have greatly expanded our knowledge of the phylogenetic relationships among passerines. A review of this literature indicates that the position of almost all major groups of passerines has been clarified. This has prompted a revision of the sequence of the passerines on the British List. The taxonomic sequence is determined based on the principle that, for each branching point in the best-supported phylogeny, the less-speciose group should be listed first. The following overview is limited to those taxa on the British List, unless otherwise indicated.

Several studies indicate that the extralimital New Zealand 'wrens' (Acanthisittidae) represent the sister-group of all other living passerines (Eupasseres), and corroborate the dichotomy between Suboscines and Oscines (Ericson *et al.* 2002, Barker *et al.* 2004, Beresford *et al.* 2005, Ewen *et al.* 2006, Chesser & ten Have 2007, Reddy & Cracraft 2007, Hackett *et al.* 2008, Irestedt *et al.* 2008, Yuri *et al.* 2008). Eastern Phoebe *Sayornis phoebe* is the only member of the Suboscines recorded in Great Britain, and is thus listed before all other passerines on the British List.

Among Oscines, a subdivision between Corvida and Passerida was recognized by Sibley and Ahlquist (1990). New studies have shown that Sibley and Ahlquist's 'Corvida' is a paraphyletic group composed of several African and Australasian clades (Barker *et al.* 2002, 2004, Ericson *et al.* 2002, Jønsson & Fjeldså 2006, Driskell *et al.* 2007, Reddy & Cracraft 2007). Of these clades, only Corvoidea (or 'crown Corvida') has been recorded in Britain. Corvoidea includes the vireos (Vireonidae), orioles (Oriolidae), shrikes (Laniidae), choughs, magpies, jays and crows (Corvidae) and several extralimital groups (Sibley & Ahlquist 1990, Barker *et al.* 2002, 2004, Beresford *et al.* 2005, Fuchs *et al.* 2006a,b, Irestedt & Ohlson 2008, Treplin *et al.* 2008). Most studies suggest that Vireonidae represents the sister-group of the other Corvoidea on the British List and that Oriolidae is sister to Laniidae and Corvidae (Barker *et al.* 2002, 2004, Beresford *et al.* 2005, Driskell *et al.* 2007, Reddy & Cracraft 2007, Irestedt *et al.* 2008, but see Irestedt & Ohlson 2008, Treplin *et al.* 2008). There is evidence that *Pyrrhocorax* is sister to all other British corvids (Cibois & Pasquet 1999, Ericson *et al.* 2005, Ekman & Ericson 2006, Manegold 2008), and that *Nucifraga* is sister to *Corvus* (Sibley & Ahlquist 1990, Cibois & Pasquet 1999, Ericson *et al.* 2005).

Monophyly of Passerida is supported by several studies (Sibley & Ahlquist 1990, Ericson *et al.*

*Corresponding author.
Email: george.sangster@nrm.se

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2000, Barker *et al.* 2002, 2004, Beresford *et al.* 2005, Jønsson & Fjeldså 2006, Reddy & Cracraft 2007, Treplin *et al.* 2008, but see Honda & Yamagishi 2000). Passerida (*sensu* Sibley & Ahlquist 1990) consists of three major groups: Sylvioidea, Muscicapoidea and Passeroidea. Recent studies provide support for the recognition of these three groups but also demonstrate that Sibley and Ahlquist (1990) misplaced some groups (including Alaudidae, Sittidae, Certhiidae, Troglodytidae, Remizidae, Paridae). We recognize Sylvioidea, Muscicapoidea and Passeroidea but base their composition on recent studies rather than on Sibley and Ahlquist (1990) (see below). Sylvioidea represents the sister taxon of Muscicapoidea + Passeroidea (Barker *et al.* 2004, Beresford *et al.* 2005, Driskell *et al.* 2007, Reddy & Cracraft 2007, Treplin *et al.* 2008).

The position of the kinglets (*Regulus*) remains unclear despite numerous studies investigating their relationships (Sheldon & Gill 1996, Barhoum & Burns 2002, Barker *et al.* 2002, 2004, Spicer & Dunipace 2004, Beresford *et al.* 2005, Reddy & Cracraft 2007, Johansson *et al.* 2008, Treplin *et al.* 2008). We place the kinglets before other Passerida as *incertae sedis*.

Sylvioidea (*sensu* Alström *et al.* 2006, 'core Sylvioidea' *sensu* Barker *et al.* 2002) includes the Bearded Tit (*Panurus biarmicus)*, larks (Alaudidae), swallows (Hirundinidae), long-tailed tits (Aegithalidae) and most babblers (traditional Timaliidae) and warblers (traditional Sylviidae).

Penduline tits (Remizidae) and tits (Paridae) are resolved as the sister-group to all other Sylvioidea in some studies (Barker *et al.* 2004, Beresford *et al.* 2005, Treplin *et al.* 2008) but their exact position is unresolved or poorly supported in others (Sheldon & Gill 1996, Alström *et al.* 2006, Johansson *et al.* 2008). All studies, however, are consistent with a position of penduline tits and tits close to, or among, Sylvioidea. We place the penduline tits and tits before all other Sylvioidea.

Monophyly of Sylvioidea (*sensu* Alström *et al.* 2006) is supported by numerous studies (Sheldon & Gill 1996, Barker *et al.* 2004, Beresford *et al.* 2005, Alström *et al.* 2006, Driskell *et al.* 2007, Reddy & Cracraft 2007, Johansson *et al.* 2008, Treplin *et al.* 2008). *Panurus* is neither a babbler nor a parrotbill but instead appears closely related to the larks (Ericson & Johansson 2003, Alström *et al.* 2006, Fuchs *et al.* 2006b, Johansson *et al.* 2008, Gelang *et al.* 2009). Neither the babblers nor the warblers are monophyletic (Sheldon & Gill 1996, Fjeldså *et al.* 1999, Barhoum & Burns 2002, Barker *et al.* 2002, 2004, Cibois 2003, Ericson & Johansson 2003, Beresford *et al.* 2005, Alström *et al.* 2006, Reddy & Cracraft 2007, Johansson *et al.* 2008, Gelang *et al.* 2009). Several authors have recognized additional family taxa for groups traditionally included in Sylviidae (e.g. Dickinson 2003, Beresford *et al.* 2005, Alström *et al.* 2006, Christidis & Boles 2008, Johansson *et al.* 2008, Nguembock *et al.* 2008). The following family taxa are adopted here (British genera in parentheses): Cettiidae (*Cettia*), Phylloscopidae (*Phylloscopus*), Sylviidae (*Sylvia*), Locustellidae (*Locustella*), Acrocephalidae (*Hippolais*, *Acrocephalus*) and Cisticolidae (*Cisticola*).

Muscicapoidea, as recognized here, includes the waxwings (Bombycillidae), nuthatches (Sittidae), treecreepers (Certhiidae), wrens (Troglodytidae), mockingbirds (Mimidae), starlings (Sturnidae), dippers (Cinclidae), thrushes (Turdinae), 'chats' (Saxicolini) and 'flycatchers' (Muscicapini).

The relationships of the waxwings are not yet fully clear, but almost all studies support a position among Muscicapoidea or a sister-group relationship to all other Muscicapoidea (Sibley & Ahlquist 1990, Barker *et al.* 2004, Cibois & Cracraft 2004, Voelker & Spellman 2004, Beresford *et al.* 2005, Reddy & Cracraft 2007, but see Barker *et al.* 2002). Waxwings are placed before all other Muscicapoidea.

Recent studies provide strong support for a clade formed by nuthatches, treecreepers, gnatcatchers (extralimital) and wrens (Sibley & Ahlquist 1990, Sheldon & Gill 1996, Barker *et al.* 2002, 2004, Ericson & Johansson 2003, Barker 2004, Reddy & Cracraft 2007, Johansson *et al.* 2008, Treplin *et al.* 2008). The relationships among these four groups are not yet clear but the majority of studies indicate a sister-group relationship of the nuthatches and the other three groups (Sibley & Ahlquist 1990, Sheldon & Gill 1996, Ericson & Johansson 2003, Barker 2004). The relationships of the Wallcreeper *Tichodroma muraria* have not yet been assessed by cladistic studies, although a close relationship between Wallcreeper and Sittidae is generally accepted (e.g. Sibley & Ahlquist 1990, Dickinson 2003).

A close relationship of the mockingbirds (Mimidae) and starlings (Sturnidae) was first proposed by Sibley and Ahlquist (1984, 1990) and is supported by at least 13 subsequent phylogenetic studies

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(Sheldon & Gill 1996, Pasquet *et al.* 1999, Barker *et al.* 2002, 2004, Ericson *et al.* 2002, Ericson & Johansson 2003, Cibois & Cracraft 2004, Voelker & Spellman 2004, Beresford *et al.* 2005, Reddy & Cracraft 2007, Johansson *et al.* 2008, Nguembock *et al.* 2008, Treplin *et al.* 2008).

The position of the dippers is not fully resolved but most studies support a sister-group relationship of dippers and a clade comprising thrushes, chats and flycatchers (Voelker 2002, Barker *et al.* 2004, Cibois & Cracraft 2004, Beresford *et al.* 2005, Reddy & Cracraft 2007, Treplin *et al.* 2008, but see Sibley & Ahlquist 1990, Voelker & Spellman 2004, Fuchs *et al.* 2006b).

Several studies support monophyly of a group formed by thrushes, chats and flycatchers (Sibley & Ahlquist 1990, Cibois & Cracraft 2004, Beresford *et al.* 2005, Treplin *et al.* 2008, but see Voelker & Spellman 2004, Fuchs *et al.* 2006b). Recent evidence indicates that the thrushes (Turdinae, *sensu* Sibley & Monroe 1990) are not monophyletic, because some taxa (e.g. *Monticola*) are part of a clade formed by chats and flycatchers (Voelker & Spellman 2004, Pan *et al.* 2006). Relationships among the 'true' thrushes have recently been clarified (Klicka *et al.* 2005, Voelker *et al.* 2006, Pan *et al.* 2007, Nylander *et al.* 2008, Voelker & Klicka 2008). Numerous studies have shown that the chats (Saxicolini) are more closely related to the flycatchers (Muscicapini) than to the thrushes (Turdinae) (Sibley & Ahlquist 1990, Chikuni *et al.* 1996, Pasquet *et al.* 1999, Barker *et al.* 2002, 2004, Cibois & Cracraft 2004, Voelker & Spellman 2004, Fuchs *et al.* 2006b, Treplin *et al.* 2008). In fact, some of these studies indicate that Saxicolini (*sensu* Sibley & Ahlquist 1990) and Muscicapini (*sensu* Sibley & Ahlquist 1990) are not reciprocally monophyletic (Cibois & Cracraft 2004, Voelker & Spellman 2004, Treplin *et al.* 2008). As a result of these studies, Turdinae includes *Zoothera*, *Ixoreus*, *Hylocichla*, *Catharus* and *Turdus* (Klicka *et al.* 2005), Muscicapini includes two British genera (*Muscicapa* and *Cercotrichas*), and Saxicolini includes *Erithacus*, *Luscinia*, *Tarsiger*, *Phoenicurus*, *Saxicola*, *Oenanthe*, *Monticola* and *Ficedula* (Cibois & Cracraft 2004, Voelker & Spellman 2004). The position of *Irania* has not yet been assessed with phylogenetic methods; we retain this taxon in Saxicolini.

Passeroidea (*sensu* Ericson *et al.* 2003) includes the accentors (Prunellidae), sparrows (Passeridae), wagtails and pipits (Motacillidae), chaffinches (Fringillini), finches, serins, crossbills and allies (Carduelini), snow buntings and longspurs (Calcariini), cardinals (Cardinalini), New World blackbirds and allies (Icterini), New World warblers (Parulini), Old World buntings and New World sparrows (Emberizini), and several extralimital groups.

Most studies support a sister-group relationship between the accentors (Prunellidae) and all other Passeroidea on the British List (Sorenson & Payne 2001, Ericson & Johansson 2003, Barker *et al.* 2004, Beresford *et al.* 2005, Johansson *et al.* 2008, Treplin *et al.* 2008, but see Sibley & Ahlquist 1990).

A close relationship between sparrows (Passeridae) and wagtails and pipits (Motacillidae) is supported by some studies (Pasquet *et al.* 1999, Sorenson & Payne 2001) but not by others (Groth 1998, Ericson *et al.* 2000, Barker *et al.* 2002, 2004, Ericson & Johansson 2003, Johansson *et al.* 2008, Treplin *et al.* 2008). However, placement of the sparrows before wagtails and pipits, irrespective of whether they are assumed to be sister-taxa, is consistent with most studies and is adopted here. The sequence of the sparrows, and of the wagtails and pipits, adopted here, reflects the relationships inferred by Allende *et al.* (2001) and Voelker (1999), respectively.

There is strong evidence that Fringillidae and Emberizidae are sister-groups (Bledsoe 1988, Sibley & Ahlquist 1990, Sorenson & Payne 2001, Beresford *et al.* 2005, van der Meij *et al.* 2005, Treplin *et al.* 2008, but see Ericson & Johansson 2003). Fringillidae consists of the genus *Fringilla* (Fringillini) and Carduelini. A sister-group relationship between these groups is supported in nearly all studies (Bledsoe 1988, Sibley & Ahlquist 1990, Groth 1998, Sorenson & Payne 2001, Yuri & Mindell 2002, van der Meij *et al.* 2005), although two suggest that Carduelini is not monophyletic (Chu 2002, Treplin *et al.* 2008).

Emberizidae consists of six major groups: Calcariini, Cardinalini, Thraupini (extralimital), Emberizini, Icterini and Parulini. Monophyly of Emberizidae is strongly supported (Bledsoe 1988, Klicka *et al.* 2000, Barker *et al.* 2002, Yuri & Mindell 2002, Ericson & Johansson 2003). The snow buntings and longspurs form a clade that is distinct from all other buntings (Klicka *et al.* 2000, 2003, 2007, Grapputo *et al.* 2001, Lovette & Bermingham 2002, Yuri & Mindell 2002, Carson & Spicer

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2003, Ericson & Johansson 2003, Alström *et al.* 2008). The name Calcariini is adopted for this group. Current evidence indicates that *Plectrophenax* is nested in *Calcarius* (*sensu* AOU 1998, Dickinson 2003) and that the latter is not monophyletic (Klicka *et al.* 2003, 2007). However, we do not merge *Plectrophenax* and *Calcarius* in one genus as suggested by Klicka *et al.* (2003), but propose to reinstate the monotypic genus *Rhynchophanes* for the extralimital McCown's Longspur *Calcarius mccownii*. As a consequence, the name *Plectrophenax* is retained for the snow buntings.

The relationships among the remaining groups (Cardinalini, Thraupini, Emberizini, Icterini and Parulini) are unclear due to conflicting results of phylogenetic studies. For instance, Cardinalini and Thraupini are supported as sister-taxa in some analyses (Bledsoe 1988, Barker *et al.* 2002, Yuri & Mindell 2002, Klicka *et al.* 2003, 2007) but not in others (Sibley & Ahlquist 1990, Klicka *et al.* 2000, Lovette & Bermingham 2002). Icterini and Parulini are resolved as sister-groups by some studies (Bledsoe 1988, Barker *et al.* 2002, Ericson & Johansson 2003) but not by all (Sibley & Ahlquist 1990, Klicka *et al.* 2000, 2003, 2007, Yuri & Mindell 2002).

Several studies indicate that the 'tanager' genus *Piranga* is actually part of the cardinal clade (Lovette & Bermingham 2002, Yuri & Mindell 2002, Burns *et al.* 2003, Klicka *et al.* 2003, 2007, Alström *et al.* 2008). The two species of *Piranga* on the British List (Summer Tanager *P. rubra* and Scarlet Tanager *P. olivacea*) are therefore placed in Cardinalini. Consequently, no member of the Thraupini is admitted on the British List.

It is doubtful whether Emberizini represents a monophyletic group. New World 'sparrows' and Old World 'buntings' form separate clades (Grapputo *et al.* 2001, Lovette & Bermingham 2002, Klicka *et al.* 2003, 2007, Alström *et al.* 2008). Several studies suggest that Old World and New World groups are not sister taxa (Lovette & Bermingham 2002, Klicka *et al.* 2003, Alström *et al.* 2008, but see Klicka *et al.* 2007). Relationships among Old World buntings have recently been clarified (Alström *et al.* 2008). Relationships among New World sparrows have been more intensively studied, but no consensus has emerged (e.g. Avise *et al.* 1980a, Zink & Blackwell 1996, Patten & Fugate 1998, Carson & Spicer 2003, Klicka *et al.* 2007, DaCosta *et al.* 2009). The sequence of the species in these groups is left unchanged.

A phylogenetic study of Icterini has identified five major clades (Lanyon & Omland 1999, see also Freeman & Zink 1995). However, as the relationships among these clades are unresolved, the taxonomic sequence is left unchanged.

Phylogenetic studies indicate that the New World warblers (*sensu* AOU 1998) are not monophyletic (Lovette & Bermingham 2002, Klein *et al.* 2004). However, all species on the British List are part of a well-supported clade consisting of 19 genera of morphologically typical parulids (Lovette & Bermingham 2002). Several traditionally accepted genera are not monophyletic (Avise *et al.* 1980b, Lovette & Bermingham 2001, 2002, Klein *et al.* 2004, Lovette & Hochachka 2006); a comprehensive revision of Parulidae is warranted.

The sequence of the passerines on the British List (including those that are not currently part of the British List but which reside in Category D) becomes as follows:

Suboscines
  Tyrannides
    Tyrannidae (*Sayornis*)
Oscines
  Corvida
    Corvoidea
      Vireonidae (*Vireo*)
      Oriolidae (*Oriolus*)
      Laniidae (*Lanius*)
      Corvidae (*Pyrrhocorax*, *Pica*, *Garrulus*, *Nucifraga*, *Corvus*)
  Passerida
      Regulidae (*Regulus*) *incertae sedis*
    Sylvioidea
      Remizidae (*Remiz*)
      Paridae (*Cyanistes*, *Parus*, *Lophophanes*, *Periparus*, *Poecile*)
      Panuridae (*Panurus*)
      Alaudidae (*Melanocorypha*, *Calandrella*, *Galerida*, *Lullula*, *Alauda*, *Eremophila*)
      Hirundinidae (*Riparia*, *Tachycineta*, *Progne*, *Ptyonoprogne*, *Hirundo*, *Delichon*, *Cecropis*, *Petrochelidon*)
      Cettiidae (*Cettia*)
      Aegithalidae (*Aegithalos*)
      Phylloscopidae (*Phylloscopus*)
      Sylviidae (*Sylvia*)
      Locustellidae (*Locustella*)
      Acrocephalidae (*Hippolais*, *Acrocephalus*)

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Cisticolidae (*Cisticola*)
Muscicapoidea
Bombycillidae (*Bombycilla*)
Tichodromidae (*Tichodroma*)
Sittidae (*Sitta*)
Certhiidae (*Certhia*)
Troglodytidae (*Troglodytes*)
Mimidae (*Mimus, Toxostoma, Dumetella*)
Sturnidae (*Sturnus, Pastor, Agropsar*)
Cinclidae (*Cinclus*)
Muscicapidae
Turdinae (*Zoothera, Ixoreus, Hylocichla, Catharus, Turdus*)
Muscicapinae (*Muscicapa, Cercotrichas, Erithacus, Luscinia, Tarsiger, Irania, Phoenicurus, Saxicola, Oenanthe, Monticola, Ficedula*)
Passeroidea
Prunellidae (*Prunella*)
Passeridae (*Passer, Petronia*)
Motacillidae (*Motacilla, Anthus*)
Fringillidae (*Fringilla, Serinus, Carduelis, Loxia, Bucanetes, Carpodacus, Pinicola, Pyrrhula, Coccothraustes, Hesperiphona*)
Emberizidae
Calcariini (*Plectrophenax, Calcarius*)
Cardinalini (*Piranga, Pheucticus, Passerina*)
Emberizini (*Pipilo, Chondestes, Passerculus, Passerella, Melospiza, Zonotrichia, Junco, Emberiza*)
Icterini (*Dolichonyx, Molothrus, Xanthocephalus, Icterus*)
Parulini (*Mniotilta, Vermivora, Parula, Dendroica, Setophaga, Seiurus, Geothlypis, Wilsonia*)

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